Fundamentals of Telecommunication Systems
EE 4330 Section 001/EE 5361 Section 051
Fall 2004, T TH 11:00-12:20 PM, Room: 106 NH

Instructor: K.R. Rao
Office: Room 530 NH
Office Hours: Monday, 11a.m. - 12 noon
       Wednesday 2 p.m. - 3 p.m.
Phone: 817-272-3478
Mailbox: Electrical Engineering, Box 19016, UTA, Arlington TX 76019
Email: rao@uta.edu
Course WWW site: http://www-ee.uta.edu/dip
Required Textbook(s):

Course Description:
The course covers the fundamentals, principles, concepts, and techniques of digital and analog communication systems such as various modulation techniques, digital data transmission and communication technologies.

Course Learning Goals/Objectives:
To obtain familiarity and gain knowledge about various analog and digital communication techniques including different modulation schemes, time-domain and frequency domain multiplexing, noise analysis and information theory.

Attendance and Drop Policy: Follow University guidelines

Tentative Lecture/Top Schedule (Course Content):

AMPLITUDE (LINEAR) MODULATION
Baseband and Carrier Communication
Amplitude Modulation: Double Sideband (DSB)
Amplitude Modulation (AM)
Quadrature Amplitude Modulation (QAM)
Amplitude Modulation: Single Sideband (SSB)
Amplitude Modulation: Vestigial Sideband (VSB)
Carrier Acquisition
Superheterodyne AM Receiver
Television

ANGLE (EXPONENTIAL) MODULATION
Concept of Instantaneous Frequency
Bandwidth of Angle Modulated Waves
Generation of FM Waves
Demodulation of FM
Interference in Angle-Modulation Systems
FM Receiver
SAMPLING AND PULSE CODE MODULATION
Sampling Theorem
Pulse-Code Modulation (PCM)
Differential Pulse Code Modulation (DPCM)
Delta Modulation

PRINCIPLES OF DIGITAL DATA TRANSMISSION
A Digital Communication System
Line Coding
Pulse Shaping
Scrambling
Regenerative Repeater
Detection-error probability
M-ary Communication
Digital Carrier Systems
Digital Multiplexing

EMERGING DIGITAL COMMUNICATIONS TECHNOLOGIES
The North American Hierarchy
Digital Services
Broadband Digital Communication: SONET
M-ary Communication
Synchronization
Digital Switching Technologies
Broadband Services for Entertainment and Home Office Applications
Video Compression
High-Definition Television (HDTV)

SOME RECENT DEVELOPMENTS AND MISCELLANEOUS TOPICS
Cellular Telephone (Mobil Radio) System
Spread Spectrum Systems
Transmission Media
Hybrid Circuit: 2-Wire to 4-Wire Conversions
Public Switched Telephone Network

BEHAVIOR OF ANALOG SYSTEMS IN THE PRESENCE OF NOISE
Baseband Systems
Amplitude-Modulation Systems
Angle-Modulation Systems
Pulse-Modulation Systems
Optimum Preemphasis-Deemphasis System
BEHAVIOR OF DIGITAL COMMUNICATION SYSTEMS IN THE PRESENCE OF NOISE
Optimum Threshold Detection
General Analysis: Optimum Binary Receiver
Carrier Systems: ASK, FSK, PSK, and DPSK
Performance of Spread Spectrum Systems

First day of classes: Aug 23, 2004
Census date: Sept 8, 2004
Last date to drop or withdraw: Nov 12, 2004
Last day of classes: Dec 3, 2004

Specific Course Requirements w/ Descriptions:
Test#1: Tuesday, Sept 28 2004,
Test#2: Thursday, Oct 28 2004,
Final: Tuesday, Dec 7, 2004

Grading: PLAN A
Test 1 30%          A=90-100%
Test 2 30%          B=80-89%
Final 35%           C=70-79%
Max(Pop Quiz 1 and 2) :5%    D=60-69%

PLAN B: (for those who miss a test – not recommended)
Max of Test 1 and Test 2 : 50% , Final: 45%
Max(Pop Quiz 1 and 2) :5%

Course grades are based on max. of Plan A and Plan B, i.e., whichever is higher.

Everyone must take the final, at the same time and same place. No exceptions.
1. No makeup. 2. No incomplete. Final exam papers will not be returned. The student, however, has the right to look at his/her exam paper and discuss it with the instructor. Final exam papers will be kept until the midsemester of the following semester. Summer counts as one semester. (No telephone calls or inquiries regarding course grades, please.) Everyone must take the tests and final exam at the same time and at the same place. If you have any questions on your returned tests, please do so within a week. Please bring your work, key and the test. Videotape students contact: Engineering center for distance education (Room 242, Nedderman Hall) : Donya Ph; 1-817-272-2352 Fax:1-817-272-5630, email: drandolph@uta.edu

Course Website:
http://www-ee.uta.edu/dip
link→courses→EE4330→syllabus,files
Student Evaluation of Teaching
Evaluation forms will be given to the students at the end of the semester.

Americans with Disabilities Act:
The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112-The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act - (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens. As a faculty member, I am required by law to provide "reasonable accommodation" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels. If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are properly accommodated.

Academic Dishonesty
It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents’ Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22).

ANY CHEATING WILL RESULT IN SEVERE PENALTIES.